

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-11 (canceled)

Claim 12 (currently amended): ~~The liner of Claim 11~~ A liner for an acetabular cup of an artificial hip joint, the liner sealing a top bore formed in the acetabular cup, the liner comprising in combination:

a concave inside surface adapted to contact a head of an artificial hip joint when said liner is within the acetabular cup;

an outside surface adjacent the acetabular cup when said liner is within the acetabular cup;

a rim extending between said inside surface and said outside surface at an opening into a region surrounded by said inside surface;

a deforming seal coupled to said outside surface and adapted to abut the acetabular cup adjacent the top bore;

a means to press said liner against the acetabular cup with sufficient force to deform said deforming seal against the acetabular cup adjacent the top bore;

wherein said means to press includes an annular groove in the acetabular cup facing inward and an annular seat adjacent said rim of said liner facing outwardly; and

an annular ring sized to fit within both the groove of the acetabular cup and said seat of said liner with the groove and said seat located so that when said annular ring is located within the groove and said seat said deforming seal abuts the acetabular cup adjacent the top bore with said deforming seal is deformed.

Claim 13 (original): The liner of Claim 12 wherein said annular ring includes a top side spaced from a bottom side by a ring thickness that is less than a thickness of the

groove of the acetabular cup and less than a thickness of the seat of the liner;

an outer side spaced from an inner side by a ring width;

said outer side having an undeformed diameter sufficient to extend at least partially into the groove of the acetabular cup;

said inner side having an undeformed diameter sufficient to extend at least partially into the seat of the liner;

said ring width less than a difference between a diameter of the groove of the acetabular cup and a diameter of the seat of the liner; and

a break in said ring, such that enlarging said break expands said outer side diameter and said inner side diameter, and narrowing said break reduces said outer diameter and said inner diameter.

Claim 14 (original): The liner of Claim 13 wherein said annular ring includes a captured end adjacent said break and a free end adjacent said break; and

a slot at said captured end adapted to reside over the pin of the acetabular cup when said ring is located within the groove of the acetabular cup and the seat of the liner, such that said ring holds the liner within the acetabular cup.

Claim 15 (currently amended): The liner of ~~Claim 14~~ Claim 12 wherein the top bore of the acetabular cup is surrounded by a planar shelf, and wherein said deforming seal is adapted to abut the shelf surrounding the top bore of the acetabular cup when said liner is located adjacent the acetabular cup;

wherein said deforming seal completely surrounds the bore; and

wherein said deforming seal includes a circular edge sized to abut the shelf surrounding the bore when said liner is located adjacent the acetabular cup.

Claim 16 (original): The liner of Claim 15 wherein said deforming seal is conical between a neck coupled to said outside surface of said liner and said circular edge of said deforming seal; and

wherein said circular edge is adapted to flex toward said outside surface of said liner when said circular edge of said deforming seal abuts the shelf surrounding the top bore of the acetabular cup.

Claims 17-24 (canceled)

Claim 25 (currently amended): ~~The liner of Claim 24~~ A liner for an acetabular cup of an artificial hip joint, the acetabular cup having a top bore formed therein near a top of a generally concave interior surface of the acetabular cup, the interior surface shaped and sized to receive said liner therein, the acetabular cup adapted to be attached to a hip bone, the liner comprising in combination:

an outside surface adapted to mate within the generally concave interior surface of the acetabular cup;

a generally concave inside surface adapted to pivotably support a head of an artificial hip joint coupled to an upper end of a femur;

a deforming seal adapted to be interposed between said outside surface and the interior surface of the acetabular cup adjacent the top bore of the acetabular cup;

wherein said deforming seal is conical between a neck coupled to said outside surface of said liner and said circular edge of said deforming seal;

wherein the top bore of the acetabular cup is surrounded by a planar shelf, and wherein said deforming seal is adapted to abut the shelf surrounding the top bore of the acetabular cup when said liner is located adjacent the acetabular cup;

wherein said circular edge is adapted to flex toward said outside surface of said liner when said circular edge of said deforming seal abuts the shelf surrounding the top bore of the acetabular cup;

a means to press said liner against the acetabular cup with sufficient force to deform said deforming seal against the acetabular cup adjacent the top bore;

wherein said means to press includes an annular groove in the acetabular cup facing inward and an annular seat adjacent said rim of said liner facing outwardly;

an annular ring sized to fit within both the groove of the acetabular cup and said seat of said liner with the groove and said seat located so that when said annular ring is located within the groove and said seat, said deforming seal abuts the acetabular cup adjacent the top bore with said deforming seal deformed;

wherein a top side spaced from a bottom side by a ring thickness that is less than a thickness of the groove of the acetabular cup and less than a thickness of the seat of the liner;

an outer side spaced from an inner side by a ring width;

said outer side having an undeformed diameter sufficient to extend at least partially into the groove of the acetabular cup;

said inner side having an undeformed diameter sufficient to extend at least partially into the seat of the liner;

said ring width less than a difference between a diameter of the groove of the acetabular cup and a diameter of the seat of the liner; and

a break in said ring, such that enlarging said break expands said outer side diameter and said inner side diameter, and narrowing said break reduces said outer diameter and said inner diameter.

Claims 26-32 (canceled)

Claim 33 (currently amended): ~~The combination of Claim 32~~ A liner and acetabular cup combination for an artificial hip joint, comprising in combination:

an acetabular cup having an exterior surface adapted to abut a hip bone and adapted to be held securely to the hip bone;

said acetabular cup having a generally concave interior surface;

said acetabular cup having a top bore extending between said interior surface and said exterior surface;

a liner having an outside surface adapted to mate within said generally concave interior surface of said acetabular cup;

said liner having a generally concave inside surface adapted to pivotably support a head of an artificial hip joint coupled to an upper end of a femur;

a deforming seal adapted to be interposed between said outside surface of said liner and said interior surface of said acetabular cup adjacent said top bore of said acetabular cup;

a means to press said liner against said acetabular cup with sufficient force to deform said deforming seal against said acetabular cup adjacent said top bore;

wherein said means to press includes an annular groove in said acetabular cup facing inward and an annular seat in said liner facing outwardly; and

an annular ring sized to fit within both said groove of said acetabular cup and said seat of said liner with said groove and said seat located so that when said annular ring is located within said groove and said seat said deforming seal abuts said acetabular cup adjacent said top bore with said deforming seal deformed.

Claim 34 (original): The combination of Claim 33 wherein a top side spaced from a bottom side by a ring thickness that is less than a thickness of the groove of the acetabular cup and less than a thickness of the seat of the liner;

an outer side spaced from an inner side by a ring width;

said outer side having an undeformed diameter sufficient to extend at least partially into the groove of the acetabular cup;

said inner side having an undeformed diameter sufficient to extend at least partially into the seat of the liner;

said ring width less than a difference between a diameter of the groove of the acetabular cup and a diameter of the seat of the liner; and

a break in said ring, such that enlarging said break expands said outer side diameter and said inner side diameter, and narrowing said break reduces said outer

diameter and said inner diameter.

Claim 35 (currently amended): ~~The combination of Claim 26~~ A liner and acetabular cup combination for an artificial hip joint, comprising in combination:

an acetabular cup having an exterior surface adapted to abut a hip bone and adapted to be held securely to the hip bone;

said acetabular cup having a generally concave interior surface;

said acetabular cup having a top bore extending between said interior surface and said exterior surface;

a liner having an outside surface adapted to mate within said generally concave interior surface of said acetabular cup;

said liner having a generally concave inside surface adapted to pivotably support a head of an artificial hip joint coupled to an upper end of a femur;

a deforming seal adapted to be interposed between said outside surface of said liner and said interior surface of said acetabular cup adjacent said top bore of said acetabular cup;

wherein said acetabular cup includes a groove extending annularly therein and facing an interior of said acetabular cup, a seat extending annularly into said liner and facing away from an interior of said liner, said seat and said groove positioned to be aligned together when said liner is located within said acetabular cup; and

a locking ring adapted to be removably located within said groove and said seat to hold said liner within said acetabular cup with said deforming seal deformed adjacent said top bore of said acetabular cup.

Claims 36-40 (canceled)